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ABSTRACT

This paper reviews published research on school-based programs to reduce sexual risk-taking behaviors. Analysis of 23 studies of school-based programs supports several conclusions about these programs. About 93 percent of all high schools offer sexuality or human immunodeficiency virus (HIV) education, and the majority of these programs include the topics of abstinence, contraception, pregnancy, and sexually transmitted diseases, including HIV and acquired immunodeficiency syndrome (AIDS). There is broad public support for both sexuality education and HIV education. Research indicates that such programs do not hasten the onset of intercourse among students or increase its frequency. Four curricula have been identified as increasing the use of condoms or contraception among some groups of participants. The proportion of junior and senior high schools with school-based health centers is small but growing rapidly. Research indicates that effective programs implemented in U.S. schools can have an important impact on reducing sexual risk taking behaviors. Recommendations are made for additional funding for such programs and for teacher training and resource allocation. (Contains 66 references.) (SM)

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School-Based Programs to Reduce Sexual Risk-taking Behaviors: Sexuality and HIV/AIDS Education, Health Clinics, and Condom Availability Programs

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SCHOOL-BASED PROGRAMS TO REDUCE SEXUAL RISK-TAKING BEHAVIORS: SEXUALITY AND HIV/AIDS EDUCATION, HEALTH CLINICS AND CONDOM AVAILABILITY PROGRAMS*

by

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* This paper is based, in part, upon School-based Programs to Reduce Sexual Risk Behaviors: A Review of Effectiveness by Douglas Kirby, Lynn Short, Janet Collins, Deborah Rugg, Lloyd Kolbe, Marion Howard, Brent Miller, Freya Sonenstein, and Laurie S. Zabin, which has been submitted for publication to Public Health Reports.

EXECUTIVE SUMMARY

In the United States in 1988 half of all males had initiated sexual intercourse by age 16.6, and half of all females did so by age 17.4. Although the sexual activity of many youth can have positive elements such as caring, personal growth and pleasure, it also has serious negative consequences, such as high rates of unintended pregnancy, sexually transmitted disease, and HIV. Because of the magnitude of these consequences and their impact upon both the lives of adolescents and our society in general, various institutions in our society have developed programs to delay the onset of intercourse and to increase the use of protection against STD or pregnancy.

For a variety of reasons, schools have played, and can play, a particularly important role in reducing sexual risk-taking behaviors. Schools are the one institution in our society regularly attended by most young people. Moreover, virtually all youths are in schools before they initiate sexual risk-taking behaviors, and a majority are enrolled in school when they initiate intercourse. In addition, schools are especially well designed to educate youth, particularly about topic areas such as sexuality, in which different concepts should be taught during different developmental stages. And finally, schools are capable of identifying high risk youth and then either providing them with health or social services or referring them for services.

During the last two decades, the vast majority of junior and senior high schools have developed programs to reduce unprotected sexual intercourse, either by delaying the onset of intercourse or increasing the use of protection against STD or pregnancy. By far the most common programs are sexuality and HIV education programs. In addition, some schools have opened school-based health centers, sometimes designed, in part, to reduce unprotected sex. Other schools have implemented school condom programs to increase the use of condoms.

This paper reviews the published research on these programs, focusing primarily upon their impact upon sexual and contraceptive behaviors, and to a lesser extent upon the prevalence of these programs and the public support for them. Twenty-three studies of school-based programs have been published in professional journals and measured program impact upon behavior.

Although the research on these prevention programs has limitations, the quality of research has improved considerably in recent years, and this review does support several conclusions about these programs.

Conclusions about sexuality and HIV education:

o About 93% of all high schools offer sexuality or HIV education. The vast majority of sexuality and HIV education programs in the United States include the following

topics: abstinence, contraception, pregnancy, and STD including HIV/AIDS. When a national sample of sexuality education and HIV/AIDS education teachers were asked what messages and information they emphasized, they most commonly indicated exercising responsibility regarding sexual relationships and parenthood, knowing the importance of abstinence and how to resist pressures to become sexually active, and having information about AIDS and other STDs. Despite the widely recognized importance of these topics, the quality and comprehensiveness of this instruction can be greatly improved.

- There is broad support for both sexuality education and HIV education. About 85% of American adults support sexuality education in schools, while about 94% support HIV education in schools.

- Research indicates that sexuality and HIV education programs in this country do not hasten the onset of intercourse. Seven studies, based upon national surveys, measured the impact of a cross-section of sexuality or HIV education programs in this country. The weight of the evidence from these studies indicates that these programs did not hasten the onset of intercourse. The evidence is particularly compelling for older students; it is less consistent for younger students. Five additional studies evaluated the impact of specific sexuality education and HIV education programs, all of which included instruction on contraception. These studies demonstrated that none of these programs hastened the onset of intercourse -- all of them either had no effect upon the initiation of intercourse or actually delayed the onset of intercourse.

- Research also demonstrates that sexuality education and HIV education programs do not increase either the frequency of intercourse or the number of sexual partners. Two studies based upon national surveys examined the impact of a cross-section of sexuality and HIV education programs upon frequency of intercourse and number of sexual partners. One of them found that AIDS instruction was not significantly related to having had two or more sexual partners ever or during the preceding year, while the second study found that adolescent males who had received AIDS instruction with resistance skills engaged in fewer acts of intercourse and had fewer sexual partners than did students who had not previously received such instruction. Four additional studies evaluated the impact of specific sexuality or HIV education programs upon frequency of intercourse. None found significant increases in frequency of intercourse and one program emphasizing resistance skills found a significant decrease among the relatively small proportion of youth who initiated intercourse after program implementation.

- Two specific curricula, Postponing Sexual Involvement and Reducing the Risk, significantly delayed the onset of sexual intercourse.

- There does not exist in the published literature any good evidence indicating that programs focusing only upon abstinence either do or do not delay the onset of

intercourse or reduce the frequency of intercourse. To date, three published studies have measured the impact of abstinence programs upon the initiation of intercourse. None of these studies found a significant impact upon the initiation of intercourse. However, all three were seriously limited methodologically.

- Research studies on the impact of programs upon use of condoms and other forms of contraception are mixed. The weight of the evidence from the national surveys indicates that sexuality education programs do somewhat increase the use of contraceptives and HIV education programs do somewhat increase the use of condoms. However, the data are not always consistent. Studies of individual programs indicate that some programs, but not all programs, can increase contraceptive or condom use among sexually experienced youth.

- There were four specific curricula which increased the use of condoms or other forms of contraception among some groups of participants. These are: Postponing Sexual Involvement, Reducing the Risk, Aids Prevention for Adolescents in School, and an untitled curriculum by Schinke, Blythe and Gilchrest.

- These four curricula which reduced unprotected intercourse by delaying the onset of intercourse and/or increasing the use of contraception had seven common characteristics: (1) a theoretical grounding in social learning or social influence theories which emphasize improvement in norms and skills, and learning from experience more than simple knowledge acquisition, (2) a narrow focus on reducing specific sexual risk-taking behaviors such as postponing sexual involvement or using contraception, (3) experiential activities to convey the information on the risks of unprotected sex and how to avoid those risks and to personalize that information, (4) instruction on social influences and pressures, (5) reinforcement of individual values and group norms against unprotected sex that are age- and experience-appropriate, (6) activities to increase relevant skills and/or confidence in those skills and (7) special training for those teachers or staff implementing the curricula. The importance of these characteristics are reinforced by the national surveys indicating the importance of teaching resistance skills.

- The few specific curricula that failed to effectively change behavior used a general decision-making approach, did not focus upon specific behaviors, did not give a clear behavioral message, and/or did not emphasize resistance skills.

- Programs in schools should both encourage youth to delay or refrain from intercourse and also encourage them to use condoms and other types of contraceptives if they initiate intercourse. Abstinence is the only 100% effective method of preventing pregnancy and STD, and programs can delay the onset of intercourse; thus abstinence and skills to resist pressure to have sex should be covered. However no known program can effectively prevent most youth from having intercourse during their high

school years, but programs can effectively increase the use of condoms and other forms of contraception; thus contraception should be covered.

These programs should be both age- and experience-appropriate. That is, programs for younger youth, fewer of whom are sexually experienced, should cover contraception, but should focus much more upon delaying intercourse, while programs for older youth, more of whom have sex, should include abstinence and skills to resist pressures to have sex, but should focus more upon using condoms and other types of contraceptives. Because levels of sexual activity vary from school to school, schools should measure objectively and accurately the level of sexual activity in their different grades and then implement appropriate curricula in these grades.

- There is insufficient direct evidence to determine whether any of these educational programs actually decreased pregnancy, birth, STD or HIV rates. However, as summarized above, there is evidence that some programs delay the onset of intercourse, reduce the number of sexual partners, reduce the frequency of intercourse, or increase the use of protection. If programs have these outcomes, then logically they should also reduce pregnancy, birth, STD and HIV rates.

Conclusions about school-based health centers:

- The proportion of all junior or senior high schools with school-based health centers is small, but growing rapidly. More than 415 junior or senior high schools have school-based clinics and more than 95 have school-linked clinics.

- There is broad support for school-based health centers. About 73% of the American adult population support making information and contraceptives available through school-based health centers.

- Two studies consistently indicate that the provision of reproductive health services (including the prescription or dispensation of contraceptives) either on campus or nearby does not hasten the onset of intercourse nor increase the frequency of intercourse. At this point in time, there is insufficient consistent evidence to determine their impact upon contraceptive use, pregnancy rates or birth rates.

Preliminary conclusions about school condom availability programs:

- The proportion of all high schools with condom availability programs is also small, but growing rapidly. More than 300 schools make condoms available on the school campuses; a small number of these schools have school health centers.

- There is also broad support for making condoms available in schools. About 65% of the American adult population support the provision of condoms through schools to help prevent HIV transmission.

- Research in progress indicates that there is considerable variation in the effectiveness of school condom availability programs. In some schools with condom programs, few students obtain condoms from the school and these programs could not be expected to have a significant impact upon school-wide rates of unprotected sexual intercourse, pregnancy or STD. In other schools with condom programs, large numbers of students obtain condoms from the schools, and these programs probably increase somewhat the use of condoms and reduce somewhat the frequency of unprotected sexual intercourse. Thus far, there is not sufficient evidence either to determine very accurately the impact of these programs upon sexual and contraceptive behaviors or to identify the critical characteristics of effective programs.

In conclusion, research demonstrates that school-based programs addressing sexual behavior and its consequences do not hasten the onset of intercourse or increase its frequency. Research also demonstrates that some, but not all, programs do effectively either delay the onset of intercourse or increase the use of protection.

If effective programs are implemented in our nation's schools, they can have an important impact upon reducing sexual risk-taking behavior. Clearly, they do not represent a total solution to the problems of unprotected intercourse -- families, community-based organizations, churches, the media and the government all must be involved, but they can provide an effective component in a larger overall strategy to reduce unintended pregnancy, STD and HIV.

These findings and conclusions in turn lead to two recommendations:

- Federal and state departments of education and health, as well as other institutions, should fund the development and rigorous evaluation of additional school-based approaches to reducing unprotected sexual intercourse, in order to further delineate the critical elements of effective programs, to enhance the effectiveness of existing effective programs, and to develop even more effective approaches for specific communities.

- Programs that have been demonstrated by sound research to be effective and that are consistent with community standards should be implemented broadly in schools throughout the United States. Teachers and other appropriate staff should be given adequate training and sufficient resources so that they can replicate the programs with sufficient fidelity to reproduce the desired behavioral change.

SCHOOL-BASED PROGRAMS TO REDUCE SEXUAL RISK-TAKING BEHAVIORS: SEXUALITY AND HIV/AIDS EDUCATION, HEALTH CLINICS AND CONDOM AVAILABILITY PROGRAMS

INTRODUCTION

CONSEQUENCES OF ADOLESCENT SEXUAL BEHAVIOR

We are sexual human beings from birth, but during adolescence, sexual feelings change and intensify. Those sexual feelings can add a vital dimension to the lives of adolescents, a dimension that has many positive elements. There can be those wonderful and intense feelings of being attracted to someone else; there can be great caring and great pleasure; and there can be the opportunity for growth that comes from an intimate relationship with another person. These positive elements should not be forgotten or ignored.

Unfortunately, there can also be many negative consequences of adolescent sexual behavior. Some of them, such as feelings of exploitation, dissatisfaction and guilt are not easily quantified; other negative consequences are dramatized by the following statistics.

More than 40% of young women in the United States become pregnant before they reach 20 years of age[1]. This is more than a million teenagers each year, producing one of the highest teenage pregnancy rates of any western industrialized country[2,3]. In 1990, the U.S. birth rate among 15- to 17-year-olds was 38 per 1,000 females; the birth rate for 18- to 19-year-olds was 89 per 1,000 females[4]. Among white adolescents aged 15 to 19, the out-of-wedlock birth rate has risen steadily every year since 1970; among black adolescents, it has risen since 1981.

In addition, among all sexually active people, teenagers have the highest rates of STD of any age group[5]; in 1991, the rate of gonorrhea among 15- to 19-year-old females was 22 times higher (1,043/100,000) than the rate for women aged 30 or older (48/100,000)[6]. Approximately one in four young people have been infected by any STD by age 21[5]. An increasing number of adolescents are becoming infected with HIV. Although relatively few of the reported AIDS cases have occurred among adolescents, about one-fifth have occurred among individuals in their twenties, many of whom were infected as teenagers[7].

These immediate consequences of adolescent sexual behavior, in turn, have long-term effects upon the lives of young people. Pregnancy among school-age youth can reduce their completed level of education, their employment opportunities and their marital stability and it can increase their welfare dependency[8]. HIV and other STDs among youth can affect their physical health, their subsequent ability to bear children, and even their chances for a normal life span. AIDS has quickly become one of the three leading causes of death among women and men 25 to 44 years old in this country[7].

Because the incidence of pregnancy and STDs among teenagers is so great, these consequences affect not only the individuals involved and their families, but also overall school drop-out rates, welfare dependency, unemployment, and medical costs in the United States. For example, each year through just three programs alone -- Aid to Families and Dependent Children (AFDC), food stamps, and Medicaid -- the United States spends more than 25 billion dollars on families with children born in preceding years to teenagers[9].

SCHOOL-BASED PROGRAMS

Faced with the magnitude of these problems, our nation through its educational institutions has responded during different eras with prevention programs. As long ago as the early 1900s there was concern that young people were having premarital sex and that the rates of "venereal disease" (VD) were increasing. Believing that accurate information about VD would prevent youth from engaging in sex, some schools implemented VD education[10]. However, many more schools began developing programs to address adolescent sexuality during the 1970s when adolescent sexual behavior, unintended pregnancy, STDs and their consequences were better measured and publicized. Schools responded far more dramatically when AIDS became a prominent problem in the latter part of the 1980s. The vast majority of schools implemented sexuality education and HIV education programs, while hundreds of schools opened school-based health centers and hundreds of other schools began making condoms available to students.

For a variety of reasons, schools have and can play a particularly important role in addressing and reducing sexual risk-taking behaviors. Schools are the one institution in our society regularly attended by most young people -- nearly 95% of all children and youths are in elementary or secondary schools[11]. Moreover, virtually all youths are in schools before they initiate sexual risk-taking behaviors, and a majority are enrolled in school when they initiate intercourse. In addition, schools are especially well designed to educate youth, particularly about topic areas such as sexuality, in which different concepts should be taught during different developmental stages. And finally, schools are capable of identifying high risk youth and then either providing them with services or referring them for services.

SEXUALITY EDUCATION AND HIV EDUCATION PROGRAMS

PUBLIC SUPPORT AND PREVALENCE

For decades there has been widespread support for sexuality education; since the advent of AIDS, there has been widespread support for HIV education. Fifty years ago -- in 1943 -- a Gallup poll revealed that 68% of adults approved of sexuality education in schools[12]; by 1988 a Harris poll revealed that this percentage had increased to 85%[13]. Furthermore, 94% of parents approve of AIDS education in schools[14]. This approval for both sexuality education and AIDS education is also manifested in state policy: Currently, 47 states either strongly

recommend or mandate the teaching of sexuality education, while all 50 states either recommend or mandate AIDS education programs[15,16].

Thus, the controversies surrounding sexuality education and HIV education do not focus upon whether sexuality education or HIV education should be taught in schools; rather they focus upon what topics should be taught. Some groups believe that only abstinence until marriage should be emphasized, while other groups believe that contraception and other sexual topics should be adequately covered.

Given both the need for effective educational programs and public support for such programs, schools have responded. According to a national study by the Alan Guttmacher Institute in 1985, about 93% of all schools offer sexuality or HIV education. Of those schools offering sexuality education, between 85% and 100% included instruction on abstinence, contraception, pregnancy, STDs and HIV/AIDS[17]. When a national sample of sexuality education and HIV/AIDS education teachers were asked what messages and information they emphasized, they most commonly indicated "exercising responsibility regarding sexual relationships and parenthood, knowing the importance of abstinence and how to resist pressures to become sexually active, and having information about AIDS and other STDs[17]. In 1991, a nationwide study of high school students indicated that 83% of the students reported that they had been taught about AIDS/HIV in school[18].

Despite the fact that most adolescents receive at least a minimum amount of sexuality or HIV education, it is widely believed by professionals in the field that most programs are short, are not comprehensive, fail to cover important topics, and are less effective than they could be[16,19]. Thus, there is a widely held belief that schools have established a foundation, but that much better programs need to be implemented more broadly throughout the country.

IMPACT UPON BEHAVIOR

During most of this century, programs to reduce unprotected intercourse were not carefully evaluated; however, during the last two decades, numerous studies have provided evidence on the effectiveness of different programs. These studies include two groups of studies: (1) those which used national survey data to examine the relationship between reported exposure to sex and/or HIV education programs and various reported behavioral outcomes and (2) experimental or quasi-experimental studies which evaluated the impact of specific programs upon such behavior.

The first group of studies was based upon large nationally representative surveys of adolescents -- the 1975 and 1979 National Surveys of Young Women (NSYW), the 1979 National Survey of Young Men (NSYM), the 1981 National Survey of Children (NSC), the 1982 National Survey of Family Growth (NSFG), the 1984 National Longitudinal Survey of Work (NLSW), the 1988 National Survey of Adolescent Males (NSAM), and the 1989 Secondary School Student Health Risk Survey (SSSHRS).

These surveys included retrospective questions both about participation in sex or HIV education programs and about personal sexual behavior. Thus, these analyses correlated respondents' reports about participation in programs with their reports about sexual behaviors, statistically controlling in a variety of ways for the effects of other characteristics of the respondents.

Because these studies sampled a cross-section of adolescents throughout the country, they also sampled participants in a cross-section of sexuality or HIV education programs throughout the country. Thus, they measured the impact of the wide range of sexuality and HIV education curricula as they actually have been implemented by the wide range of teachers in our nation's schools. This representativeness is in contrast to the studies which evaluated model curricula often taught by teachers who may have volunteered and who typically received specially developed training to teach their respective curricula.

Studies based upon national surveys have several major limitations. First, they necessarily rely upon the respondents' recall of whether or not they received sexuality or HIV education. Because this instruction is sometimes integrated into a variety of other topics, and may vary greatly in length, content and quality, respondents often had to use their own criteria to determine whether they had, in fact, received sufficient instruction to say they had been exposed to a program.

Second, the surveys failed to measure in any detail the characteristics of the sexuality or HIV education instruction that the participants received. Typically the surveys asked four or fewer questions about the content of the students' instruction. Thus, these surveys provided little information about the quality of the programs, and relatively comprehensive and long-term programs were "averaged together" with brief superficial programs.

Third, with national survey data, controlling for all other explanatory variables that might produce spurious relationships between education and sexual behavior is impossible. For example, there is a belief among some professionals that during the 1970s and 1980s sexuality education was disproportionately likely to have been taught either in communities where such school instruction was more acceptable or in high-risk schools where there was greatest need. Because this selection bias could never be fully controlled statistically, it could have produced spurious relationships between receipt of sexuality education and sexual activity; alternatively, it could have obscured relationships indicating desirable effects.

In contrast, all the studies in the second group evaluated specific programs with experimental or quasi-experimental designs. All those studies assigned students to program and comparison groups; all used some method of making the program and comparison groups similar before program implementation -- some randomly assigned individual students, classrooms of students, or entire schools to treatment or control groups; and all studies followed individual students over time and linked their pretest and post-test data.

Even though each of these studies evaluated only one (or a small number of programs), collectively these studies evaluated programs which varied considerably -- they focused upon different goals, included different components, were implemented in different parts of the country, and targeted different populations of youth.

Initiation of Sexual Intercourse

Five studies based upon national surveys examined whether receipt of sexuality education was related to initiation of intercourse. Their results are mixed.

The 1976 and 1979 NSYW, the 1979 NSYM and the 1981 NSC failed to measure the timing of instruction and initiation of intercourse at all. Thus, studies based upon these surveys were not able to use more sophisticated and powerful statistical methods and were less capable of measuring the impact of instruction. Nevertheless, analyses of the 1976 and 1979 NSYW and the 1979 NSYM indicated that there was not a significant relationship between sexuality education and sexual experience among 15 to 19 year-old women and 17 to 21 year-old men[20]. However, the data presented in published tables reveals that among women aged 15 to 17 years, sexuality education was significantly associated with a greater probability of having initiated intercourse, while among women aged 18 to 19 years, it was associated with a lower probability of having initiated intercourse. Among males 17 to 18 years old, there was not a significant relationship.

Analyses of the 1981 NSC found that 15 and 16 year-old students who had participated in a sexuality education class were significantly less likely to have initiated intercourse than similar-aged students who had not received sexuality education[21].

According to the 1982 NSFG survey, among females aged 15 to 19 years, there were no significant relationships between subsequent initiation of sex and instruction on pregnancy only or pregnancy and contraception combined, except possibly among those who received instruction and initiated intercourse when they were 14 years old[22]. Among 14-year olds, the results varied depending upon the assumption made about the temporal order of instruction and initiation of sex when they took place during the same year.

The 1984 NLSW survey included data for both sexes[23]. For older teens aged 17 and 18 years, previous participation in sexuality education was not associated with subsequently initiating intercourse, but for younger teens aged 15 or 16 years, previous participation in sexuality education was positively associated with subsequent initiation of intercourse. This association held both for those teens who reported they had ever had a sex education course and also for those who had ever had a course which specifically included contraception.

Finally, the most recent 1988 NSAM study focused upon 15- to 19-year-old males[24]. It found that the association between sexuality education and subsequent initiation of intercourse varied with the topics covered. Instruction on biological topics or contraception was

significantly associated with earlier initiation of intercourse, while instruction on HIV or resistance skills was significantly associated with later initiation of intercourse. When three or all four of these topics were covered, there was not a significant relationship with onset of intercourse, with one exception -- instruction on biological topics, AIDS and resistance skills, in combination, was significantly associated with later initiation of intercourse.

In sum, the studies based upon national surveys and measuring the relationship between sexuality education topics and initiation of intercourse produced some seemingly inconsistent results and suggest that the impact of instruction might vary with the topics covered and with the age of the students. A plausible interpretation is that instruction on resistance skills may delay the initiation of intercourse and that instruction about contraception alone may hasten the onset of intercourse among younger teens, but not among older teens.

Notably, except for the 1988 NSAM, all of these surveys were conducted either during the late 1970s or early 1980s, when abstinence and postponing sexual involvement were not given as much emphasis as they were during the later 1980s and 1990s. As reported above, the messages currently emphasized in sexuality and HIV education programs are "the importance of abstinence and how to resist pressures to become sexually active." Thus, these survey data indicate that programs taught today, which give more emphasis to resisting pressures to have sex, do not hasten the onset of sexual intercourse.

Eight evaluations of specific sexuality education or HIV education curricula examined the impact of these programs upon the initiation of intercourse. Three of these studies evaluated the impact of abstinence programs. These are the only studies published in the professional literature. Abstinence programs, in general, focus upon the importance of abstinence from sexual intercourse, typically abstinence until marriage. Either these programs do not discuss contraception or they briefly discuss contraceptive failure to provide complete protection against pregnancy and STD.

Two of the studies examined different implementations of the same program called "Success Express."[25,26] These two evaluations analyzed post-test data collected only six weeks after the pre-test data. Because only a small percentage of youth initiate sexual intercourse during any six-week period, there was not a reasonable chance that the Success Express program could significantly reduce the initiation of sex among program group members below that of the comparison group members during the short period of the studies.

The third study evaluated the impact of a program called "Project Taking Charge"[27]. Its six-month follow-up did not find an impact upon the initiation of intercourse at the .05 level (although it did find an impact at the .10 level). The generalizability of this study was limited by its small sample size.

Thus, given the studies published to date, there is not sufficient evidence to determine whether or not programs that focus only upon abstinence delay the onset of intercourse.

The other five studies examined the impact of more comprehensive sexuality and HIV education programs[28-35]. In general, these programs differ from the abstinence programs in that they discuss both abstinence and contraception; the sexuality education programs typically include discussions of different methods of contraception while the HIV education programs typically include discussions of condoms.

None of these five programs significantly hastened the onset of intercourse. This finding is particularly important, given that two of these programs focused upon middle school youth, all of them included youth in grade 10 or lower, and all included youth 16 years old or younger. Furthermore, the two curricula that specified delaying the onset of intercourse as a clear goal (Postponing Sexual Involvement[36] and Reducing the Risk[37] successfully reduced the proportion of sexually inexperienced students who initiated sex during the following 12 to 18 months [30,34]. Notably, both of the program groups also received instruction on contraception.

These data strongly support the conclusion that sexuality and HIV education curricula that include discussions of contraception in combination with other topics -- such as resistance skills -- do not hasten the onset of intercourse. These findings should reduce concerns that such instruction may encourage youth to have intercourse. They also demonstrate that some, but not all, programs can delay the initiation of sex.

Numbers of Sexual Partners and Acts of Intercourse

The two remaining studies based upon national surveys examined different measures of sexual activity. One study based upon the 1990 SSSHRS found that AIDS instruction was not significantly related to having had two or more sexual partners ever or during the preceding year[38]. In contrast, the analysis of the 1988 NSAM found that adolescent males who had received HIV instruction with resistance skills engaged in fewer acts of intercourse and had fewer sexual partners than did students who had not previously received such instruction[39]. However, instruction about biology topics, AIDS without resistance skills and birth control were not significantly related to either the number of partners or the number of acts of intercourse.

Four studies of specific sexuality and HIV education programs measured the impact of these programs upon the frequency of sexual activity among those who had initiated intercourse[30,31,33,34,40]. None of the programs significantly increased or decreased the frequency of intercourse among those who were sexually experienced prior to the curriculum. However, Postponing Sexual Involvement significantly reduced the frequency of intercourse among the relatively small proportion of students who initiated intercourse after the curriculum was implemented.

In sum, these studies consistently indicate that sexuality and HIV education do not increase the frequency of sexual intercourse among youth, and two studies indicate that programs with resistance skills may actually reduce the frequency of such activity.

Use of Contraception

Six studies based upon national survey data examined the impact of sexuality education on the use of contraception. The studies of the 1976 NSYW, the 1979 NSYW and the 1979 NSYM found statistically significant relationships between sexuality education instruction and use of contraception both during first intercourse and during any sexual experience, but only for blacks and not for whites[20]. The study based upon the 1982 NSFG found that instruction about pregnancy and contraception was positively related to use of contraceptives during first intercourse and to use of contraceptives ever, but not to use at the time of the interview[22]. The analysis of the 1984 NLSW found a positive relationship between sexuality education and contraceptive use during the month preceding the interview[23]. In contrast, the analyses of the 1988 NSAM included data on males only and failed to find a significant relationship between instruction on biological topics, birth control, HIV, or resistance skills and use of contraception at first intercourse[39].

In addition to these studies of general contraceptive use, three of the cross-sectional studies examined the impact of HIV education upon the use of condoms specifically. The analysis of 1989 SSSHRS failed to find a significant direct relationship between HIV instruction and condom use, but there appeared to be an indirect relationship through knowledge[38]. In contrast, the analysis of the 1988 NSAM found that among adolescent males (the only gender they studied), instruction on HIV, contraception and resistance skills was not significantly related to use of condoms at first intercourse, but instruction on these topics was significantly and independently associated with greater condom use during the year preceding the interview[39].

The data from this study also indicated that during the 1980s, when information about HIV was disseminated to the public through schools and public awareness campaigns, increasingly large percentages of males used condoms.

In sum, these results varied both with the particular study and with the time interval of the contraceptive measure (e.g., first intercourse versus intercourse during a period preceding data collection). However, four of the five survey data sets did produce some positive significant relationships between participation in a sex or HIV education program and either contraceptive use or specifically condom use, while the fifth data set revealed a possible indirect effect through greater knowledge.

Eight studies measured the impact of specific programs upon contraceptive use. The McMaster Teen Program[40] and STEP[41,42] did not have a significant impact upon contraceptive use[35,43,44]. Teen Talk[45] and the Kirby untitled curricula found inconsistent or mixed results[29,33]. Postponing Sexual Involvement, in combination with instruction on human sexuality and contraception, increased use of contraception among those who initiated intercourse after the program, but not among those who were sexually experienced at the time of the pre-test[30,31]. Reducing the Risk increased contraceptive use among sexually

experienced females and lower risk youths, but not among males or higher risk youths[34]. The Schinke/Blythe/Gilchrest untitled curriculum increased use of contraception among all sexually experienced students[46]. And AIDS Prevention for Adolescents in School[47] increased condom use among all sexually experienced youths[48].

In addition, it should be recognized that the primary goal of Reducing the Risk was to reduce unprotected intercourse, in part through delaying the onset of intercourse and in part through increasing the use of contraception among sexually active youth. Accordingly, its evaluation examined its impact upon a composite measure involving both abstinence and use of contraception. Results indicated that the curriculum significantly reduced unprotected intercourse among students who were sexually inexperienced before the program[34].

In sum, the data from all eight studies indicate that some, but not all, of these programs increased contraceptive use. Only two of the eight programs significantly increased contraceptive use among all sexually experienced youths, but two additional curricula increased contraceptive use among specific sub-groups of students.

CHARACTERISTICS OF EFFECTIVE EDUCATION PROGRAMS

The differential effects of different programs leads to the question: What are the distinguishing characteristics of effective programs? Because of both the small number of studies and the variation among the studies' target populations, methodological rigor and statistical power, any observations of commonalities among effective programs must necessarily be preliminary and tentative.

Four programs clearly had a positive impact upon behavior: the Schinke/Blythe/Gilchrest curriculum, Postponing Sexual Involvement, Reducing the Risk, and AIDS Prevention for Adolescents in School. A review of these curricula indicates that they share the following characteristics, which may be linked to their success.

Effective programs included a narrow focus on reducing sexual risk-taking behaviors that may lead to HIV/STD infection or unintended pregnancy. All four effective programs focused upon a small number of specific behavioral goals, such as delaying the initiation of intercourse or using protection; relatively little time was spent addressing other sexuality issues, such as gender roles, dating, and parenthood.

Effective programs used social learning and social influence theories as a foundation for program development. In general, the effective programs were based upon theoretical approaches that have been demonstrated to be effective in influencing other health-risk behaviors, e.g., social cognitive theory[49] social influence theory[50] social inoculation theory[51] cognitive behavioral theory[46,49],. When applied to sexual behavior, social learning theories posit that behavior such as delaying the initiation of intercourse or using protection will be affected by an understanding of what must be done to avoid sex or to use protection

(knowledge), a belief in the anticipated benefit of delaying sex or using protection (motivation), the belief that particular skills or methods of protection will be effective (outcome expectancy) and the belief that one can effectively use these skills or methods of protection (self-efficacy). Social learning theories give considerable recognition to the fact that youths gain these understandings and beliefs directly through education and indirectly by observing the behavior of others. In addition, social influence theories address the societal pressures upon youths, and the importance of helping youths understand and resist those pressures. Thus, these programs go far beyond the cognitive level; they focus on recognizing social influences, changing individual values, changing group norms, and building social skills.

Effective programs provided basic, accurate information about the risks of unprotected intercourse and methods of avoiding unprotected intercourse through experiential activities designed to personalize this information. Although increasing knowledge was not the primary goal of these programs, all four provided basic information that students needed to assess risks and avoid unprotected sex. Typically, this information was not unnecessarily detailed or comprehensive. For example, the curricula did not provide detailed information about all methods of contraception or different types of STD. Instead, they emphasized the basic facts needed to make behaviorally relevant decisions.

This information was provided through active learning methods of instruction, not through didactic instruction. Students were involved in numerous experiential classroom and homework activities: small group discussions, games or simulations, brainstorming, role-playing, written rehearsal, verbal feedback and coaching, locating contraception in local drugstores, visiting or telephoning family planning clinics, and interviewing parents.

In addition to these experiential activities, several of the curricula used peer educators or videos with characters (either real or acted) who resembled the students and with whom the students could identify. All of these activities helped the students personalize the information.

Effective programs included activities that address social or media influences on sexual behaviors. The effective programs discussed social pressures to have sex. This took several forms. Postponing Sexual Involvement, the Schinke, Blythe, Gilchrest untitled curriculum, and AIDS Prevention for Adolescents in School addressed media influences (e.g., how sex is used to sell products and how the television shows often suggest that characters have unprotected intercourse but don't experience the consequences). At least one curriculum, Reducing the Risk, discussed situations that might lead to sex. All of the curricula discussed "lines" that are typically used to get someone to have sex, and both AIDS Prevention for Adolescents in School and Reducing the Risk discussed social barriers to using protection (e.g., embarrassment about buying condoms).

Effective programs reinforced clear and appropriate values in order to strengthen individual values and group norms against unprotected sex. The effective programs focused upon and

continually reinforced specific values or norms (i.e., postponing sex, avoiding unprotected intercourse, using condoms, and avoiding high-risk partners).

Critically, the values and norms expressed in these programs were tailored for the age and experience of the target population. As an example, Postponing Sexual Involvement was developed for middle school youths and focused upon delaying intercourse; given that the majority of middle school youths in the targeted areas had not yet initiated intercourse, the message was appropriate for most students. The Schinke/Blythe/Gilchrest curriculum and Reducing the Risk, on the other hand, were designed for high school students and explicitly emphasized that students should avoid unprotected intercourse, either by not having sex or by using contraception if they did have sex. Finally, AIDS Prevention for Adolescents in School targeted higher-risk youths, many of whom were already sexually active, and emphasized the importance of using condoms and avoiding high-risk situations.

The importance of promoting values and norms that are age- and experience-appropriate is demonstrated by the fact that Postponing Sexual Involvement, which emphasized delay in initiating intercourse, did not reduce the frequency of intercourse nor increase the use of contraceptives among those students who had already had sex. Thus, it appeared to be less effective for sexually experienced youths. Similarly, AIDS Prevention for Adolescents in School, which emphasized condom use, did not affect abstinence. Thus, it was less effective for sexually inexperienced youths. In other words, the norms emphasized in the curriculum needed to match the experience of the students.

The effective programs used a variety of instructional strategies to reinforce specific values and norms. For example, instruction which emphasized the negative consequences of engaging in sex or unprotected sex provided the proper knowledge base for these norms; the discussion of lines to get someone to have sex and effective responses strengthened norms against such lines; the role-playing activities which successfully ended in the avoidance of unprotected intercourse reinforced the norms against unprotected sex; small group discussions which appraised possible risk-taking scenarios and reached consensus about their excessive risk further reinforced peer norms against risk-taking behavior. In addition, a few programs provided accurate information on the rates of certain behaviors or the acceptability of those behaviors to emphasize that "not everyone is doing it," as is often assumed by teens. Finally, some of the curricula used either peer leaders or testimonials from respected peers to contribute to the development of conservative group norms. Collectively, these types of activities helped establish or clarify standards of group behavior, and may have given students the support or "permission" they needed to feel comfortable choosing to avoid sexual activity or to insist on the use of a condom or other methods of contraception.

Effective programs provided modeling and practice of communication and negotiation skills. All of the effective programs devoted some time to skill development (i.e., communication, negotiation and refusal skills). Typically, the programs provided information about the skills, modeled effective use of the skills, and then provided some type of skill rehearsal and

practice (e.g., verbal role-playing or written practice). There were, however, significant variations in the quality of and amount of time devoted to skill practice.

Effective programs provided training for individuals implementing the program. All of the effective programs provided training for the teachers or peers who implemented the program. This training ranged from approximately six hours to three days. In general, the training was designed to give teachers and peers information on the programs as well as practice in using the teaching strategies included in the curricula (e.g., conducting role plays, leading group discussions, etc.).

In sum, the four effective programs shared seven common characteristics: (1) narrow focus on reducing sexual risk-taking behaviors, (2) theoretical grounding in social learning and social influence theories, (3) experiential activities designed to personalize basic information on the risks of unprotected sex and how to avoid those risks, (4) instruction on social influences, (5) reinforcement of individual values and group norms against unprotected sex, (6) activities to develop skills and (7) teacher or peer leader training.

Despite these commonalities, there is very little evidence regarding which of these factors or combinations of factors contributes most to the overall success of the programs. For example, knowledge is known to be insufficient to change behavior[52]. However, assuming that the positive behavioral effects resulted from just the skill practice or the instruction on social influences would be premature. To understand which characteristics are necessary for behavior change, one must compare the characteristics of effective programs with those of programs that had no measurable impact on student risk behaviors.

Differences Between The Educational Programs That Were Effective And Those That Were Not Effective

Because only three of the studies reported no significant behavioral impact (i.e., STEP, the McMaster Teen Program and the Kirby untitled programs), generalizations about the differences between the effective and ineffective programs must be made cautiously. However, there do appear to be several differences that distinguish the two groups. First, the ineffective curricula tended to be less focused and more comprehensive. That is, they covered a broader array of topics and discussed many values and skills, but they failed to emphasize those particular facts, values, norms and skills necessary to avoid sex or unprotected sex.

Second, the less effective curricula tended to use a decision-making model in which the decision-making steps were taught; the model was applied to important decisions; and students were implicitly instructed to make their own decision. This approach is in contrast to the methods used in the effective curricula, which presented a clear stand and emphasized clear behavioral values and norms. For example, one of the ineffective curricula, the McMaster Teen Program, asked students to identify reasons for and against having sex, but

did not process the discussion beyond the generation of ideas. In contrast, Postponing Sexual Involvement, one of the effective programs, asked students to identify reasons why teens have sex, to identify reasons students should wait to have sex, and then to assess the reasons to have sex and to postpone having sex in terms of likely consequences. Given this structure, the student groups usually concluded that the reasons to wait were more compelling. Because all four of the effective programs clearly focused upon specific behavioral values and norms and none of the ineffective programs did so, this focus may be a particularly important characteristic of effective programs.

There were also program characteristics that professionals in the field have previously believed might be important, but that did not appear to discriminate between effective and ineffective curricula. One example is length. Although Reducing the Risk was one of the longest programs (15 sessions) and one of the most effective programs, other long programs were not effective (McMaster Teen Program -- 10 sessions; STEP -- 18 sessions; Kirby untitled programs -- up to 45 sessions). Furthermore, some shorter programs were effective (Postponing Sexual Involvement in combination with Human Sexuality -- 10 sessions, AIDS Prevention for Adolescents in School -- 6 sessions). Thus, length may not be as critical as previously believed.

Skill practice is another example of a curriculum component which may not be sufficient to produce behavioral change. Although it is difficult to quantify the amount of skill practice in each of the curricula, it is nevertheless clear that STEP, the McMaster Teen Program, and some of the Kirby untitled curricula did not significantly change behavior, but they had more skill practice than Postponing Sexual Involvement or AIDS Prevention for Adolescents in School which did significantly change behavior. Perhaps skills practice is effective only when clear values or norms are emphasized.

SCHOOL-BASED AND SCHOOL-LINKED HEALTH CENTERS

CHARACTERISTICS AND PUBLIC SUPPORT

As the problems of unintended teenage pregnancy and AIDS have gained greater prominence in our society, some schools have developed programs to improve access to contraceptives. The first such efforts were school-based and school-linked health clinics. By definition, school-based clinics are located on school campuses, while school-linked clinics are located across the street or nearby, have close links with the schools and typically implement educational programs or other programs in the schools. The first school-based clinics opened in 1970. By 1993, there were 415 school-based clinics and about 100 school-linked clinics providing services in middle schools or high schools or working closely with these schools[53]. Although these numbers represent a very small proportion of all schools in the country, the numbers are increasing.

These health clinics provide students with a wide range of primary health care services, e.g., physical examinations, treatment of illness and minor injuries, immunizations, substance abuse programs, nutrition education, and personal counseling. They do not focus upon family planning, but some of them do provide reproductive health services. According to a 1993 study of these clinics, more than 60% provide counseling, referral or follow-up for family planning methods and about 37% write prescriptions for oral contraceptives, but only 20% actually dispense contraceptives on site[53]. Of those clinics that do prescribe or dispense contraceptives, a minority of the visits are for contraceptives[54]. Thus, even those clinics are not "family planning clinics" as some opponents of clinics have claimed.

Many school-based clinics have opened with broad public support and little controversy, while others have opened with considerable controversy over the provision of reproductive health services in the schools. Some people have opposed the provision of reproductive health services, believing that providing contraceptives or referring for contraceptives will sanction sexual intercourse, provide the means for protected sexual intercourse, and thereby hasten and increase the frequency of sexual intercourse. Proponents of comprehensive reproductive health services have argued that it is illogical, morally wrong, and inconsistent with established public health practices to provide STD tests, treatment for STD, pregnancy tests and prenatal care, and not to provide condoms or other contraceptives which would help prevent these cases of STD and unintended pregnancy.

In general, most adults do support the provision of contraceptive services. According to a 1988 Harris poll, 73% of Americans favor making birth control information and contraceptives available through school-based clinics[55].

IMPACT UPON SEXUAL AND CONTRACEPTIVE BEHAVIORS AND BIRTH RATES

Two studies have measured the impact of school-based clinics and school-linked clinics upon sexual and contraceptive behaviors[54,56]. In Baltimore, an adolescent reproductive health clinic, called the "Self Center," provided educational, counseling and reproductive health services in that clinic and educational and counseling services in two schools, a junior high school that was four blocks away and a high school that was across the street. In both schools, the staff implemented a peer education program and after-school group discussions, while in the clinic the staff provided individual counseling, group counseling and contraceptive services[57].

According to the survey data collected from the program schools and the matched comparison schools, there was a delay in the onset of sexual intercourse among those youths who had not yet initiated sex. The study also indicated that the Self Center increased the use of contraception among those who had initiated intercourse[56].

A second study evaluated the impact of six school-based clinics located on six school campuses in different parts of the country[54]. Two of them referred students for

contraceptives; one wrote prescriptions that could be filled at a nearby Planned Parenthood clinic; and three dispensed contraceptives in the school clinics. The quality of their education programs varied from site to site.

An analysis of survey data collected from the clinic schools and comparison schools (or survey data collected before and after the clinic opened) revealed that in general, clinic presence was not significantly associated with initiation of intercourse or frequency of intercourse. Among males in five of the sites, there were no significant differences in the percent who had initiated intercourse nor in the age of first intercourse. In the sixth site (which dispensed contraceptives), the males in the clinic school were less likely than males in the comparison school to have initiated intercourse. Among females, there were no significant differences in four of the sites. In one site (which only referred students for contraception) clinic school females were more likely to have initiated intercourse. In the sixth site (which prescribed contraceptives), clinic school females were less likely to have initiated intercourse than comparison school females.

Among neither gender in any of the schools was clinic presence significantly associated with frequency of intercourse.

The impact of the clinics upon contraceptive use was mixed[54]. At one site where the clinic focused upon high-risk youths, emphasized pregnancy prevention, and dispensed oral contraceptives, there was a significantly greater use of oral contraceptives among females than among females in the comparison school. However, there was no difference in condom use. At two other sites which dispensed both condoms and oral contraceptives but did not have strong educational components, no significant differences were found between the clinic and comparison schools in use of condoms by male students or use of oral contraceptives by female students. At the site which prescribed contraceptives and had a strong educational component, male students reported higher rates of condom use and female students reported higher rates of contraceptive use than did their counterparts in the comparison school. At the fifth site, which had a strong educational component and referred students for services, clinic presence was associated with greater use of condoms. Finally, at the last site which had weak educational and clinic components, there were no significant differences in condom or contraceptive use.

In sum, the data from both studies indicate that providing reproductive health services either on campus or nearby does not hasten the onset of intercourse or increase the frequency of intercourse. These data should diminish concerns about the provision of reproductive health services possibly sanctioning and increasing sexual activity.

On the other hand, the impacts of the clinics upon contraceptive use were inconsistent among the different clinics and thus, their impact cannot be determined conclusively. However, it is clear that there is a substitution effect -- some of the students who obtained reproductive health services from the school clinic or school-linked clinic would have obtained them elsewhere if the clinics had not been there. Given that the largest behavioral effects were

observed in those sites that had the strongest educational components, these data are also consistent with the hypothesis that the presence of a strong educational component is more critical than the provision of reproductive health services on school campuses.

Both of these studies and three additional studies examined the impact of their programs upon either pregnancy or birth rates.

A study of the impact of the first clinics in St. Paul upon birth rates gave a great impetus to the school-based clinic movement. That study indicated that birth rates declined markedly in three different schools after clinics providing reproductive health care (including prescriptions for contraception) were opened[51]. However, those conclusions were based upon only one baseline year for each school and upon the staffs' knowledge of births among students.

Subsequently, those limitations were overcome by generating birth rates from school and public records for five baseline years and multiple post-clinic years[58]. In addition, birth rate data for all five schools with clinics was examined. That study found large year-to-year variations in school-wide birth rates, but no evidence indicating that the clinics significantly reduced birth rates in any of the schools.

The Baltimore study found that after the Self Center opened, there was a continued small increase and then a large decrease in pregnancy rates for two years[56]. This small increase and large decrease was in contrast to a large increase in pregnancy rates in the comparison schools that continued throughout the 28-month observation period. Furthermore, students who were in the program schools longer (and thus exposed to the program longer) demonstrated greater decreases in pregnancy rates than those students who were in the program schools a shorter period of time. However, the validity of these findings on pregnancy rates is limited by the few years of pregnancy data collected.

The nation-wide study of six school-based clinics found that clinic presence was not significantly related to pregnancy rate in any of the six school-based clinic sites, after background characteristics of the students were statistically controlled[54].

Finally, in a small rural South Carolina community, a comprehensive school and community campaign was implemented[60,61]. Teachers, administrators, and community leaders were given training in sexuality education; sexuality education was integrated into all grades in the schools; peer counselors were trained; the school nurse counseled students, provided male students with condoms and took female students to a nearby family planning clinic; and finally, local media, churches, and other community organizations highlighted special events and reinforced the messages of avoiding unintended pregnancy. After the program was implemented, the pregnancy rate for 14- to 17- year-olds declined significantly for several years[60]. After parts of the program ended (e.g., the school nurse resigned; linkages to contraceptives were terminated; and some teachers left the school), the pregnancy rates returned to pre-program levels[61].

In sum, these results are inconsistent and it remains unclear whether school-based or school-linked reproductive health services, either by themselves or in addition to education programs, significantly decrease school-wide pregnancy or birth rates. However, it seems probable that not all of the students who received reproductive health services in the school clinic would have received those services elsewhere, if the clinics had not provided those services. Thus, it is likely that the clinics did prevent some unintended pregnancies, and that this number could not be adequately estimated from the somewhat limited evaluation methods which have been used to evaluate clinic impact.

SCHOOL CONDOM AVAILABILITY PROGRAMS

During the late 1980s and early 1990s an increasing number of high schools began making condoms available to students as part of their HIV/AIDS prevention programs. Condoms are available in schools in some of our nation's largest cities, such as New York City, Los Angeles and Philadelphia; they also are available in many smaller cities such as Falmouth, Massachusetts; Commerce City, Colorado; and Santa Monica, California. By the fall of 1993, condoms were available in more than 375 schools in 47 different cities nationwide[62]. The number of schools making condoms available represents a very small proportion of all schools, but it, too, is rapidly increasing.

Some of the schools making condoms available do so through school-based health centers. Others have trained selected faculty, staff, or volunteers to provide condoms at specified times and places. Still others have vending machines or "fish bowls" where students can obtain condoms anonymously.

According to an on-going nation-wide study of condom availability programs, 35% of the schools making condoms available require active parental consent (condoms are given to students only if their parents have signed a consent form permitting this); 11% require passive consent (parents are notified in writing of the program and condoms are not given to those students whose parents notified the school not to do so); and 54% do not require any type of parental consent[62].

In most schools, condom availability constitutes one component in a larger more comprehensive program which also includes educational components and which encourages youth both to delay having intercourse and to use condoms if they do have intercourse.

There are several contemporary theoretical models which have successfully predicted health behaviors, e.g., the health belief model, the theory of reasoned action, social learning theory, and the AIDS risk reduction model (AARM). These theoretical models predict that school condom programs would increase the use of condoms to the extent that the programs reduce barriers to obtaining condoms, model how to get condoms without negative consequences, increase self-efficacy about getting and using condoms, and change school norms about condom use.

School condom programs may reduce barriers to obtaining condoms in at least three ways. First, many adolescents report that they are embarrassed buying condoms at drug stores or other stores. If condoms are made available in schools, either anonymously or confidentially and in a non-judgmental manner, this embarrassment can be reduced or eliminated. Second, some adolescents report that the cost of purchasing condoms may dissuade them from buying condoms. Thus, if schools provide them either free of charge or at a very low cost, this potential barrier is removed. Third, some students, especially those without cars, may have some difficulty going to a store alone or especially to a family planning clinic across town that provides condoms free of charge. Thus, school condom programs can increase physical accessibility.

School condom programs may also change school norms about condom use. The mere fact that the school is making condoms available does provide some sanction or reinforcement for obtaining and using condoms. In addition, if condoms are made available in a school nurse's office, affirmative interaction with the nurse, posters on the wall, and other characteristics of the office may create a climate supportive of obtaining and using condoms. Finally, if some students see other students obtaining condoms, this may change peer norms about how many of their peers use condoms to avoid unprotected sexual intercourse.

Although making condoms available in schools remains very controversial, 65% of the American adult population supports condom availability in high schools to prevent the transmission of HIV/AIDS[63].

IMPACT OF SCHOOL CONDOM PROGRAMS

Because school condom availability programs are relatively new, there is little published research on these programs. Thus, most statistics must necessarily come from research on school-based clinics which made condoms available and from personal communications with program directors or investigators currently conducting research on condom programs.

As discussed above, the research on school-based and school-linked clinics clearly indicates that the provision of contraceptives, including condoms, on school campuses is not associated with earlier onset of intercourse or greater frequency of intercourse. The same studies provide inconsistent evidence for the impact of dispensing contraceptives on actual use of contraceptives.

In addition to those studies of school-based and school-linked clinics, there is also preliminary data on the numbers of condoms obtained by students in schools. These data indicate that there is considerable variation in the numbers of condoms obtained by students. In some schools, small numbers of condoms are obtained by students and these small numbers of condoms are not likely to have much school-wide impact upon students' sexual or contraceptive behaviors. However, in other schools, students obtain such large numbers of condoms from the schools, these condoms are likely to reduce unprotected intercourse.

For example, in a California high school with about 2,700 students, the students obtain about 2,600 to 3,000 condoms per month[64]. In six Maryland schools with school-based clinics, students obtained between 100 and 600 condoms monthly from each of the school-based health clinics[65]. In a Florida high school, the 1,300 students obtained about 1,500 condoms per month[66]. Given that many of the students in these schools had never had intercourse or did not have intercourse each month, the condoms obtained from these schools had the potential for significantly increasing condom use and reducing the frequency of intercourse not protected by condoms.

Notably, the greatest numbers of condoms were obtained not in those schools where getting them might be anonymous (e.g., through condom machines in the bathrooms), but in those locations where there appears to be social support for getting and using condoms (e.g., nurse's offices). This is consistent with the theories described above.

In addition, cost appears to be an important factor. In schools where condoms are sold, far fewer appear to be obtained by students than in schools were they are made available free of charge. This suggests that for some students, the cost of condoms may be a significant barrier that school condom programs have the potential for overcoming, or that the personal contact and encouragement by the school staff on this issue is important.

It should be remembered that the research on school-based clinics clearly indicated that a provider substitution effect did exist[54]. That is, it is undoubtedly true that some of the students who obtained condoms from the schools would have obtained condoms elsewhere, if the schools had not made them available.

On the other hand, the same research on school-based clinics indicated that not all students would have obtain contraception elsewhere if the schools had not made it available. The study summarized student survey data from three schools indicating that an additional 6% to 13% of both male and female students would have had sexual intercourse without contraception, if the schools had not provided contraception[54]. Notably, these percentages from the three schools were higher for males (who were more likely to obtain condoms) than females (who were more likely to obtain oral contraceptives). Thus, it seems likely that in those schools where students obtained large numbers of condoms from the schools, some students used condoms who would otherwise not have used condoms.

In sum, the large variation in numbers of condoms obtained by students from their schools indicates that the characteristics of the programs may be critical to determining their success. Well designed programs may increase condom use and reduce unprotected intercourse, while poorly designed programs may not.

CONCLUSIONS

Nearly a century has passed since the first programs to reduce unprotected intercourse were implemented in schools. Subsequently, many approaches have been tried. There has been considerable disappointment, partly because programs have not been nearly as effective as many people had hoped, and partly because program evaluations have been incapable of measuring small effects. However, there is room for optimism; both programs and evaluation methods have improved considerably during the past several years and there is now evidence that a few programs can reduce unprotected intercourse, either by delaying the initiation of intercourse or by increasing the use of contraceptives.

Although the research on these prevention programs is limited, this review of the research on school-based programs to reduce unprotected sex does support several conclusions about these programs.

- About 93% of all high schools offer sexuality or HIV education. The vast majority of sexuality and HIV education programs in the United States include the following topics: abstinence, contraception, pregnancy, STD and HIV/AIDS. They also emphasize responsibility and abstinence. When a national sample of sexuality education and HIV/AIDS education teachers were asked what messages and information they emphasized, they most commonly indicated exercising responsibility regarding sexual relationships and parenthood, knowing the importance of abstinence and how to resist pressures to become sexually active, and having information about AIDS and other STDs. Despite the widely recognized importance of these topics, the quality and comprehensiveness of this instruction can be greatly improved.

- The proportion of all junior or senior high schools with school-based health centers or condom availability programs is small, but growing rapidly. More than 510 junior or senior high schools have school-based or school-linked clinics, while more than 300 make condoms available on the school campuses.

- There is broad support for sexuality education, HIV education, health centers and the provision of condoms in public schools. About 85% of American adults support sexuality education in schools; about 94% support HIV education in schools; 73% support making information and contraceptives available through school-based health centers; and 65% support the provision of condoms through schools to help prevent HIV transmission.

- Seven studies, based upon national surveys, measured the impact of a cross-section of sexuality or HIV education programs in this country. The weight of the evidence from these studies indicates that these programs do not hasten the onset of intercourse. The evidence is particularly compelling for older students; it is less consistent for younger students. Five additional studies evaluated the impact of specific sexuality education and HIV education programs, which included instruction

on contraception. These studies demonstrated that none of these programs hastened the onset of intercourse -- all of them either had no effect upon the initiation of intercourse or actually delayed the onset of intercourse.

- Two studies based upon national surveys examined the impact of a cross-section of sexuality and HIV education programs upon frequency of intercourse and number of sexual partners. One study found that AIDS instruction was not significantly related to having had two or more sexual partners ever or during the preceding year, while the second study found that adolescent males who had received AIDS instruction with resistance skills engaged in fewer acts of intercourse and had fewer sexual partners than did students who had not previously received such instruction.

- Four studies evaluated the impact of specific sexuality or HIV education programs upon frequency of intercourse. None found significant increases in frequency of intercourse and one program emphasizing resistance skills found a significant decrease among the relatively small proportion of youth who initiated intercourse after program implementation.

- There does not exist in the published literature any good evidence indicating that programs focusing only upon abstinence either do or do not delay the onset of intercourse or reduce the frequency of intercourse. To date, three published studies have measured the impact of abstinence programs upon the initiation of intercourse. None of these studies found a significant impact upon the initiation of intercourse. However, all three were seriously limited methodologically.

- The weight of the evidence from the national surveys indicates that sexuality education programs do somewhat increase the use of contraceptives and HIV education programs do somewhat increase the use of condoms. However, the data are not always consistent. Studies of individual programs indicate that some, but not all, programs can increase contraceptive or condom use among sexually experienced youth.

- There were four curricula which reduced unprotected intercourse, either by delaying the onset of intercourse or increasing the use of protection. These are: Postponing Sexual Involvement, Reducing the Risk, Aids Prevention for Adolescents in School, and an untitled curriculum by Schinke, Blythe and Gilchrest.

- These four effective curricula had seven common characteristics: (1) a theoretical grounding in social learning or social influence theories, (2) a narrow focus on reducing specific sexual risk-taking behaviors, (3) experiential activities to convey the information on the risks of unprotected sex and how to avoid those risks and to personalize that information, (4) instruction on social influences and pressures, (5) reinforcement of individual values and group norms against unprotected sex that are age- and experience-appropriate, (6) activities to increase relevant skills and/or confidence in those skills and (7) special training for those teachers or staff

implementing the curricula. The importance of these characteristics are reinforced by the national surveys indicating the importance of teaching resistance skills.

- The few curricula that failed to effectively change behavior did use a general decision-making approach, but did not focus upon specific behaviors, did not give a clear behavioral message, and did not emphasize resistance skills.

- Because programs can effectively delay the onset of intercourse and increase the use of condoms and other types of contraception, and also because no existing program prevents most youth from having intercourse during their high school years, programs in schools should both encourage youth to delay or refrain from intercourse and also encourage them to use condoms and other types of contraceptives if they initiate intercourse. These programs should be both age- and experience-appropriate. That is, programs for younger, less experienced, youth should focus more upon delaying intercourse, while those for older, more experienced, youth should focus more upon using condoms and other types of contraceptives.

- Two studies consistently indicate that the provision of reproductive health services (including the prescription or dispensation of contraceptives) either on campus or nearby does not hasten the onset of intercourse nor increase the frequency of intercourse. At this point in time, there is insufficient consistent evidence to determine their impact upon contraceptive use, pregnancy rates or birth rates.

- Research in progress indicates that there is considerable variation in the effectiveness of school condom availability programs. In some schools with condom programs, few students obtain condoms from the school and these programs could not be expected to have a significant impact upon school-wide rates of unprotected sexual intercourse, pregnancy or STD. In other schools with condom programs, large numbers of students obtain condoms from the school, and the programs probably increase the use of condoms and reduce the frequency of unprotected sexual intercourse. Thus far, there is not sufficient evidence either to determine very accurately the impact of these programs or to identify the critical characteristics of effective programs.

- There is insufficient direct evidence to determine whether any of these educational, clinic, or condom programs actually decreased pregnancy, birth, STD or HIV rates. However, as summarized above, there is evidence that some programs delay the onset of intercourse, reduce the number of sexual partners, reduce the frequency of intercourse, or increase the use of protection. If programs have these outcomes, then logically they should also reduce pregnancy, birth, STD and HIV rates.

In conclusion, there do not exist any single magic solutions to teenage sexual behavior. After all, teenage sexual and contraceptive behaviors are related to large societal forces, e.g., adult sexual and contraceptive behaviors, poverty, sexual and physical abuse, family values

and others. Research also demonstrates that not all school-based sexuality and HIV education programs are effective.

On the other hand, it is very important to realize that research studies also demonstrate that some school-based programs are effective. If these effective programs are implemented in our schools, they can have an important impact upon reducing sexual risk-taking behavior. Clearly, they do not represent a total solution to the problems of unprotected intercourse -- families, community-based organizations, churches, the media and the government all must be involved, but they can provide an effective component in a larger overall strategy to reduce pregnancy, STD and HIV.

These findings and conclusions in turn lead to two recommendations:

- Federal and state departments of education and health, as well as other institutions, should fund the development and rigorous evaluation of additional school-based approaches to reducing unprotected sexual intercourse, in order to further delineate the critical elements of effective programs, to enhance the effectiveness of existing effective programs, and to develop even more effective approaches.

- Programs that have been demonstrated by sound research to be effective and that are consistent with community standards should be implemented broadly in schools throughout the United States. Teachers and other appropriate staff should be given adequate training and sufficient resources so that they can replicate the programs with sufficient fidelity to reproduce the desired behavioral change.

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